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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 10/594,895 | 11/07/2006 | Tadahiro Ohmi | 039262-0165 | 8302 |
| 23428 7590 07/07/2010 FOLEY AND LARDNER LLP SUITE 500 3000 K STREET NW WASHINGTON, DC 20007 | | | | |
| EXAMINER | | | | |
| BROWN, VALERIE N | | | | |
| ART UNIT | | PAPER NUMBER | | |
| 2829 | | | | |
| MAIL DATE | | DELIVERY MODE | | |
| 07/07/2010 | | PAPER | | |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/594,895

Applicant(s)

OHMI ET AL.

Examiner

VALERIE BROWN

Art Unit

2829

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 June 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 3 and 4 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 3, and 4 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/22)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 06/11/10 has been entered.

Claim Objections

2. Claim 4 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 4 is a duplicate of claim 3 and should be cancelled to fix this deficiency.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 3, and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 20040245584 (Murakawa et al) in view of US6830652 (Ohmi et al)

Concerning claim 1, **Murakawa** discloses a plasma processing method in which plasma is generated by the use of a plasma excitation gas ([0088] lines 1-4) and a process gas is introduced into said plasma to thereby process an object to be processed ([0092]), but does not disclose said plasma processing method being characterized in that said process gas includes nitrous oxide gas and said nitrous oxide gas is introduced into the plasma whose electron temperature is less than binding energy 2.24 eV between a nitrogen molecule and an oxygen atom in said nitrous oxide or that the plasma process is characterized by introducing said plasma excitation gas into a process chamber from an upper shower plate, generating said plasma under said upper shower plate, causing said plasma to pass through a lower shower plate provided under said upper shower plate so as to reach said object to be processed, and introducing said nitrous oxide gas from said lower shower plate into the plasma under said lower shower plate. However **Murakawa** discloses using an electron temperature of 0.7 to 2 eV for an oxidation process ([0088] lines 7-12) and that NO, N₂O, NO₂ and NH₃ could be used instead of the oxygen source ([0093]). Additionally **Murakawa** discloses that the reaction conditions (electron temperature included) may be any kind so long as a high quality film is formable. Generally, differences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or

temperature is critical. “[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.” In *re* Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). Therefore, absent any evidence that the claimed electron temperature provides new and unexpected results it would have been obvious to one of ordinary skill in the art at the time of the invention to perform routine experimentation to determine an optimal electron temperature and accordingly optimize the device manufacturing process.

Additionally, **Ohmi** discloses a plasma processing apparatus that has a dielectric shower plate (103) and a lattice-like shower plate (111) in a configuration in which the dielectric in which the dielectric shower plate (which supplies the plasma excitation gas) is above (therefore the upper shower plate) the lattice-like shower plate (which supplies the process gas) (therefore making it the lower shower plate) and the plasma is caused to pass through the lattice-like shower plate to reach a substrate below, and that this configuration provides a greatly improved freedom of the process and higher-speed processes (column 4 lines 15- 61). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use the configuration as disclosed by **Ohmi** in plasma processing in order to have higher speed processes and reduce the amount of time need to manufacture the devices.

Continuing to claims 3 and 4, **Murakawa** discloses a method of manufacturing an electronic device characterized by comprising a step of carrying out an oxynitriding process to said object to be processed by the use of the plasma processing method according to claim 1 (**Murakawa** [0091] note that it is disclosed that the nitride processing unit forms the nitride film

by nitriding a part of the surface of the silicon oxide film thereby making an oxynitride film at least at the interface between the nitride layer and the oxide layer).

Response to Arguments

5. Applicant's arguments with respect to claim 1 have been considered but are moot in view of the new ground(s) of rejection which can be found in the above body of the office action.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to VALERIE BROWN whose telephone number is (571)270-5015. The examiner can normally be reached on Mon-Fri 6:00am-3:30pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ha Nguyen can be reached on (571) 272-1678. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Valerie Brown/
Examiner, Art Unit 2829
07/02/10

/Ha T. Nguyen/
Supervisory Patent Examiner, Art Unit 2829